

# Abstract

Fabrication method for a semiconductor structure having a partly filled trench

The present invention provides a fabrication method for a semiconductor structure having a partly filled trench, having the following steps: provision of a semiconductor structure (1, 5) having a trench (2); filling of the trench (2) with a filling (10) in such a way that the filling (10) projects above a surface (OF) of the semiconductor structure (1, 5) by a first height (h1), the filling (10) covering the trench (2) and the periphery (20) of the trench (2); planarization of the filling (10) in a first etching step in such a way that the filling (10) is essentially planar with the surface (OF) of the semiconductor structure (1, 5); and sinking of the filling (10) in the trench (2) in a second etching step by a predetermined depth (T) proceeding from the surface of the semiconductor structure (1, 5); essentially the same plasma power and the same etchant composition being used for the first and second etching steps.

(Figure 1d)

List of reference symbols

1	Silicon semiconductor substrate
2	Trench
5	Hard mask
6	Polysilicon filling
20	Periphery
$\Delta 1, \Delta 2, \Delta 3$	Fluctuation ranges
$h_1, h_2$	Height
$T, T_0, T_1$	Depth
OF	Surface